

CLAIMS

WHAT IS CLAIMED IS:

- 1 1. A method of testing a planar lightwave circuit comprising:
 - 2 coupling a first optical probe having a side-polished optical fiber to the
 - 3 planar lightwave circuit; and
 - 4 testing an optical pathway within the planar lightwave circuit by transmitting
 - 5 or receiving light through the first optical probe.
- 1 2. The method of claim 1 further comprising:
 - 2 coupling a second optical probe having a second side-polished optical fiber
 - 3 to the planar lightwave circuit; and
 - 4 using the second optical probe in combination with the first optical probe to
 - 5 send and receive a light beam through the planar lightwave circuit.
- 1 3. The method of claim 1 further comprising:
 - 2 using an index-matching fluid as an interface between the first optical probe
 - 3 and the planar lightwave circuit.
- 1 4. The method of claim 1 further comprising:
 - 2 adding an additional layer of upper cladding to the planar lightwave circuit
 - 3 after removing the first optical probe.

1 5. The method of claim 1, wherein testing the optical pathway within the planar
2 lightwave circuit is performed on a PLC wafer prior to dicing the PLC wafer.

1 6. The method of claim 1, wherein testing the optical pathway within the planar
2 lightwave circuit is performed on a PLC die prior to permanently attaching optical fibers
3 to the PLC die.

1 7. The method of claim 1, wherein testing the optical pathway within the planar
2 lightwave circuit is performed on a PLC die after permanently attaching optical fibers to
3 the PLC die.

1 8. A method of testing a planar lightwave circuit comprising:
2 coupling a first optical probe to a first portion of the planar lightwave circuit;
3 directing a light beam through the first optical probe into the planar
4 lightwave circuit;
5 coupling a second optical probe to a second portion of the planar lightwave
6 circuit; and
7 receiving the light beam through the second optical probe, wherein the first
8 and second optical probes comprise side-polished optical fibers.

1 9. The method of claim 8 further comprising:
2 using an index-matching fluid as an interface between the first optical probe
3 and the planar lightwave circuit.

1 10. The method of claim 8, wherein the first optical probe is positioned with six
2 degrees of freedom.

1 11. The method of claim 8, wherein the second optical probe is positioned with
2 six degrees of freedom.

1 12. The method of claim 8, wherein directing the light beam through the first
2 optical probe into the planar lightwave circuit is accomplished by coupling a laser to the
3 first optical probe.

1 13. The method of claim 8, wherein testing the planar lightwave circuit is
2 performed on a PLC wafer comprising multiple identical PLC dice.

1 14. The method of claim 8, wherein testing the planar lightwave circuit is
2 performed on a PLC die prior to permanently attaching optical fibers to the PLC die.

1 15. The method of claim 8, wherein testing the planar lightwave circuit is
2 performed on a PLC die after permanently attaching optical fibers to the PLC die.

1 16. An optical probe comprising:
2 an optical fiber that has been side-polished; and
3 an alignment stage to hold the optical fiber in position as a directional
4 coupler with a planar waveguide.

1 17. The optical probe of claim 16, wherein the alignment stage allows six degrees
2 of freedom for movement of the optical fiber.

1 18. The optical probe of claim 16 further comprising:
2 a laser coupled to provide a light beam into optical fiber.

1 19. The optical probe of claim 16 further comprising:
2 a photodetector coupled to receive a light beam through the optical fiber.

1 20. A method of making an optical probe comprising an optical fiber having a
2 core and an outer cladding, the method comprising:
3 polishing a side of the optical fiber until the core of the optical fiber is
4 exposed; and
5 attaching a first portion of the optical fiber to an alignment stage.

1 21. The method of claim 20 further comprising:
2 attaching a second portion of the optical fiber to a light source.

1 22. The method of claim 20 further comprising:
2 attaching a second portion of the optical fiber to photodetector.